on state websites on PCB hazards (Table 2) also indicates that states typically do not have requirements for or in most cases even provide guidance on testing or inspections for PCB hazards to school systems or the public. The internet search survey identified only five states - Connecticut, Massachusetts, Minnesota, New Jersey, and Vermont - that directly provide some sort of testing guidance for schools (or guidance that is generally applicable to any state agency) and one state, Tennessee, that provided links to other websites where testing information was available. The only state with an identifiable testing or inspection requirement is Connecticut, but the requirement is tied to funding of potential construction projects within a school and is not a general requirement to test all schools for PCBs.

Table 2. *Availability of PCB information on state websites. Results of internet search for information on official state websites on PCBs in schools. A ✓ indicates that information is directly available on an official state government website, and a ✓ indicates that information is available through links to other websites, most generally the U.S. Environmental Protection Agency, and an ✗ indicates that information was not readily available.*

	General Information	Testing Guidance	Reporting Guidance	Disposal Guidance	PCBs in Ballast	PCBs in Caulk
Alabama	✗	✗	✗	✗	✗	✗
Alaska	✓	✗	✗	✗	✗	✗
Arizona	✗	✗	✗	✗	✗	✗
Arkansas	✗	✗	✗	✗	✗	✗
California	✓	✗	✗	✗	✓	✗
Colorado	✗	✗	✗	✗	✗	✗
Connecticut	✓	✓	✓	✓	✓	✓
Delaware	✗	✗	✗	✗	✗	✗
District of Columbia	✗	✗	✗	✗	✗	✗
Florida	✓	✗	✗	✓	✓	✗
Georgia	✗	✗	✗	✗	✗	✗
Hawaii	✗	✗	✗	✗	✗	✗
Idaho	✗	✗	✗	✓	✓	✗
Illinois	✓	✗	✗	✓	✓	✗
Indiana	✓	✗	✗	✗	✗	✗
Iowa	✗	✗	✗	✗	✗	✗
Kansas	✗	✗	✗	✓	✗	✗
Kentucky	✗	✗	✗	✓	✗	✗
Louisiana	✗	✗	✗	✗	✗	✗
Maine	✗	✗	✗	✗	✗	✗
Maryland	✓	✗	✗	✗	✗	✗
Massachusetts	✓	✓	✗	✓	✓	✓
Michigan	✗	✗	✗	✓	✓	✗
Minnesota	✓	✓	✓	✓	✓	✓
Mississippi	✓	✗	✗	✓	✓	✓

Missouri	✗	✗	✗	✓	✗	✗
Montana	✗	✗	✗	✗	✗	✗
Nebraska	✗	✗	✗	✗	✗	✗
Nevada	✗	✗	✗	✗	✗	✗
New Hampshire	✓	✗	✗	✗	✗	✗
New Jersey	✓	✓	✓	✓	✓	✓
New Mexico	✓	✗	✗	✓	✗	✗
New York	✓	✗	✗	✓	✓	✓
North Carolina	✓	✗	✗	✗	✗	✗
North Dakota	✓	✗	✗	✓	✓	✓
Ohio	✗	✗	✗	✓	✗	✗
Oklahoma	✓	✗	✗	✓	✗	✗
Oregon	✓	✗	✓	✓	✓	✓
Pennsylvania	✗	✗	✗	✗	✗	✗
Rhode Island	✗	✗	✗	✓	✓	✗
South Carolina	✓	✗	✗	✓	✗	✗
South Dakota	✓	✗	✗	✗	✗	✗
Tennessee	✓	✓	✗	✓	✓	✓
Texas	✓	✗	✗	✓	✗	✗
Utah	✓	✗	✗	✗	✗	✗
Vermont	✓	✓	✗	✗	✓	✓
Virginia	✓	✗	✗	✗	✗	✓
Washington	✓	✗	✗	✓	✓	✗
West Virginia	✗	✗	✗	✗	✗	✗
Wisconsin	✓	✗	✗	✓	✗	✗
Wyoming	✓	✗	✗	✓	✓	✗

Absent a requirement to test or inspect schools for PCB contamination, the discovery of PCB hazards in schools occurs by chance and differs from case to case. In most cases, PCB hazards are found after an exposure event occurs, during renovations, or prior to school demolition. In addition, there have been cases in which parents, teachers, or staff insisted a school test for PCB hazards or performed their own testing. There are even examples of school districts publically stating that the EPA advises school not to test for PCBs, as is the case for Worcester, Massachusetts just this year.[30] The *Worcester Telegram and Gazette* reported, "According to the School Department, the EPA advises schools not to test for PCBs."

The EPA provided 17 cases in which the PCB hazard was specifically reported as being from fluorescent light ballast.[31] Of those 17, only one case was clearly initiated through a preventative and systemic testing of a school district. The Los Angeles Unified School District (LAUSD) collaborated with the EPA in 2015 to develop guidelines in order to upgrade its lighting, first by surveying all school buildings for PCB-containing fluorescent light ballast, then by creating a clear plan to remove all identified PCB-containing lighting, ultimately approving $30 million to replace nearly 40,000 PCB-containing fluorescent light ballast.[32,33] A concerned parent or other unplanned event caused the initiation of the remainder of the cases.

While a leaking PCB-containing ballast is a clear sign of a potential PCB hazard and the basis of many parent-led

reporting of potential PCB hazards, PCB-containing caulk is not readily identifiable by visual inspection.[34,35] While there may be cases of schools proactively testing caulk for PCBs, the cases identified in this report were found because a parent or teacher reported something out of the ordinary or because there were several reports of similar but unusual health issues within a school. For example:

- The New York City Public Schools case began in 2008 when a group of parents and concerned citizens provided test results of caulk from schools to the EPA and the *New York Daily News*. Ultimately, a lawsuit filed by the New York Lawyers for the Public Interest compelled New York City Schools to conduct a pilot study and test a subset of schools. A more detailed account of the New York City Schools case is provided on *page 25*.

- In Lexington, Massachusetts, an article in *The Boston Globe*[36] prompted parents to request information regarding the status of PCB hazards within the city's schools. This led to the testing of caulk within the schools, where PCBs above allowable levels of 50 ppm were found (this case is included on *page 15*).[37]

- In Newburgh, New York, a parent notified the EPA in 2013 of leaking fluorescent light ballast that led to prioritization of the school for lighting replacement.

- The 2005 case in Yorktown Heights, New York involved a parent who continuously pushed for the school to address concerns about possible PCB hazards after independently testing scraps of caulk found on the school grounds revealed levels of PCBs above 50 ppm. This led to the school district removing the PCB-containing caulk from the school. The Yorktown Heights case is highlighted on *page 25*.

- The 2013 case in Malibu, California began with the reporting of illnesses within the school. In Malibu, several teachers reported concurrent diagnoses of thyroid cancer (an increased risk for thyroid cancer has been linked to PCB exposure).[38] When PCBs were found in the caulk, EPA did not enforce removal and instead agreed that the school did not need to test any further caulk in the area where it was found.[39] In March 2015 legal action under TSCA's citizen suit provision was taken against the school district, which ultimately required the testing and removal of all PCBs from two schools (details of this case are included on page 14).40

- In the 2015 case in Monroe, Washington several teachers and students reported mysterious illnesses. This led to the discovery of several fluorescent lights with PCB-containing ballast around the school that had leaked over many years. After the EPA got involved, the school hired a consultant that found PCB-containing caulk in the school as well. In May 2016 the school submitted a plan to EPA to replace the caulk and remove PCB-containing light fixtures by September 2016.

- In some cases, PCB hazards are not discovered until schools are slated for demolition. For example, Montgomery County Schools in Maryland had several cases in which PCBs were discovered during due diligence sampling prior to demolition.

Absent a systemic inspection and testing effort, the identification of PCB hazards in schools will continue to rely on chance, highly engaged parents and teachers, or the discovery of avoidable exposures or illnesses after they occur, and potential PCB hazards are all but certain to remain undetected in schools across the nation.

Lexington, Massachusetts

Joseph Estabrook Elementary school was built in the early 1960s in Lexington, Massachusetts.[98] Nearly 50 years later, in 2009, the EPA publically released guidance regarding PCBs in caulk in buildings built between 1950 and 1979.[99,100] A *The Boston Globe* article on PCBs caused parents within the Town of Lexington to push for testing of PCBs in their town's schools. The town subsequently contracted a team from Environmental Health and Engineering to test the caulk in Estabrook for PCBs. The surface tests revealed some samples of caulk with PCB concentrations above 50 ppm, the maximum acceptable standard under TSCA. The town requested further air sampling, which also revealed PCB concentrations in the air above the EPA's advised maximum.[101] The town worked quickly with the EPA to remove the contaminated caulk in the rooms with dangerous-levels of PCBs.[102]

The town, in cooperation with the EPA, set a target air concentration at which children six years old would be safe at or below 230 nanograms per cubic meter (ng/m^3).[103] This level is based on the youngest students in the school and length of time spent in the classroom, as per EPA's guidance. In considering the uncertainty in a single air test, the school district and the environmental consulting group hired by the school further decided that only classrooms in which a single air test had PCB levels below 75% of the target level (173 ng/m^3) would not require further testing or followup.

When air samples still measured PCBs above 230 ng/m^3 after the contaminated caulk was removed, the town sealed the remaining interior caulking and flushed the school with air from the outside, per EPA recommendation. Estabrook closed for a full week surrounding Labor Day in 2010 until the process was complete.[104] The town continued to take air samples regularly and adhere to EPA's best management practices for ventilation and cleaning thoroughly for the next year. Such testing revealed mixed results as PCB air concentrations in most of the school were largely reduced below the target 230 ng/m^3 but specific rooms and areas still contained higher and unsafe concentrations.[105,106] Ultimately, the town decided to tear down the original building and built a new Estabrook Elementary School that welcomed students in time for the 2014-15 school year. This marks the first time in the United States that a school was torn down due to PCB contamination.[107]

Throughout the process, the town communicated its findings, options for how to proceed, and EPA recommendations and procedures to parents, guardians, and teachers[108] through community meetings, direct mailings, press releases, and an FAQ page on the school website.[109,110,111]

In 2012, the Town of Lexington filed suit in the U.S. District Court in Boston against Monsanto Company (the sole producer of PCBs), Pharmacia Corporation, and Pecora Corporation, the companies that made and distributed the PCBs, and also sought class action status.[112] The suit claimed that the producers of PCBs should have known the health risks of using PCBs in construction materials and failed to provide adequate warnings, and sought to have Monsanto reimburse Massachusetts school districts for the cleanup[113,114] In 2015, the court rejected the class action certification and also the suit itself, ruling that Congress did not outlaw PCBs until 1979 and that Lexington did not provide sufficient evidence that Monsanto knew of the dangers of the substance before it was banned.[115]